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Use of South Farnborough Data to forecast Hay Fever incidence in London

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With notation

X = sum of mean monthly maxima in April and ~~June~~ MAY at South Farnborough (°C)

N = sum of mean monthly minima in April and ~~June~~ MAY at South Farnborough (°C)

M = sum of daily pollen counts in May at St Mary's Hospital (in units of 100)

Then, deriving formulae from 1961-70 data:

Total Pollen Count (May - August) in units of 100 is given by,

$$T = 9M + 8N - 2.5X + 15 \qquad \text{(Mult. correl. 0.95)}$$

Results can be classified under the following headings:

Forecast		Actual	
Over 50	Severe	Over 50	Severe
45-50	Moderate to Severe	34 - 49	Moderate
38-44	Moderate	Below 34	Low
30-37	Moderate to Low		
Under 30	Low		

Test years	Forecast	Actual
1971	Moderate to Low	Moderate
1972	Moderate	Moderate
1973	Moderate to Low	Moderate

Number of days with counts over 50

$$D_{50} = 3.8M + 2.3N - 1.2X + 30 \qquad \text{(Mult. correl. 0.93)}$$

Test years	Forecast	Actual
1971	23	25
1972	24	23
1973	23	25

Number of days with counts over 100

$$D_{100} = 3.1M + 3.2N - 1.7X + 23.7 \qquad \text{(Mult. Correl. 0.96)}$$

Test years	Forecast	Actual
1971	10	11
1972	14	12
1973	12	15

NOT TO BE QUOTED

Start of Hay Fever Season (first day with count over 50)

This must be designed as a "fail-safe" forecast, and if the first fortnight, and more especially the second week, in June is unfavourable for pollen release, the first day of a 50 catch is likely to be delayed.

Earliest possible date in June = $34.7 - 0.4M - 0.4N - 0.8X$

An alternative formula uses the mean 1 ft earth temperatures at Kew in April (S_A) and May (S_M).

$$30 - 0.6M - 0.65S_A - 1.35S_M$$

Results

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Actual	4	10	10	5	11	7	12	9	8	8
SF	4	9	7	3	6	7	8	8	6	7
Kew	4	9	8	3	6	7	8	9	7	8

	1971	1972	1973
Actual	12	16	9
SF	6	8	8
Kew	8	8	9

which suggests that soil temperatures may be a better guide, although the Kew site is not ideal.

Any comments or suggestions on this paper should be referred to the author.

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